

A REVIEW OF THE NORTH AMERICAN FLEA GENUS *SPICATA* I. FOX,
1940 (SIPHONAPTERA: CERATOPHYLLIDAE)

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Abstract.—The species and subspecies of the genus *Spicata* are reviewed. *Dactylopsylla comis scapoosei* Hubbard, *D. c. tacomae* Hubbard, and *D. c. walkeri* Hubbard are **new synonyms** of *Spicata comis* (Jordan); *Dactylopsylla minidoka* Prince and Stark is a **new synonym** of *Spicata nuditenacula* (Prince), and *Dactylopsylla moorei moorei* Hubbard and *D. m. oregona* Hubbard are **new synonyms** of *Spicata pacifica* (Hubbard). A key to the remaining species is provided and their diagnostic characters are illustrated.

Key Words: *Spicata*, Ceratophyllidae, distribution, host/parasite, pocket gopher

There are three genera of fleas that are specific ectoparasites of North American geomyid rodents commonly known as pocket gophers. As might be expected they appear to be closely related, have a somewhat confusing nomenclatural history, and, in recent years, have been assigned to the subfamily Dactylopsyllinae. Members of the genus *Foxella* Wagner 1929 are distributed from western Indiana west to British Columbia and south to at least central Mexico. The other two genera, *Dactylopsylla* Jordan 1929 and *Spicata* I. Fox 1940 are much more poorly known and are restricted to western North America from Colorado and Wyoming, west to the coast, and south into Mexico.

Until now the genus *Spicata*, which was resurrected by Smit (1983), contained eight species, three of which contained named subspecies, for a total of twelve named taxa. Since the name was erected, ten of these names have been introduced into the literature with no apparent effort being directed toward exploring their validity. Indeed two of the species are still known only from females, certainly not the diagnostic sex in this order of insects. The following

is an attempt to bring some order to the genus with an eye toward a taxonomic revision of the subfamily to which it belongs. Except for *S. comis* (Jordan) I have examined the primary types of all of the species and have concluded that there are only six valid species, at most. Following is a generic diagnosis, a key to the species and a brief resumé of what little is known of these taxa. Acronyms used are USNM = National Museum of Natural History, Smithsonian Institution, Washington, DC; BMNH = The Natural History Museum, London.

Genus *Spicata* I. Fox 1940

Spicata I. Fox 1940: 272–276. Type species: *Dactylopsylla (Spicata) rara* I. Fox 1940. Original designation.

This genus contains species with the following diagnostic characters: *Head:* With a ventral seta between the lowest setae in the frontal and ocular rows. Eyes vestigial to absent, when present, unpigmented. Sensory pits on antennomeres 4–6, normal for the family. *Thorax:* First pair of lateral plantar setae on tarsomere V not displaced on to the plantar surface. *Abdomen:* Spicules on sternites very indistinct or absent.

Male modified segments: Tergum VIII without an area spiculosa on inner surface. Sternite VIII with at least a few long ventral setae. Posterior portion of distal arm of st IX with a patch of 3–25 setae which may be relatively long and straight or short and curly. Apical portion of this sternite forming a complete, elongated ellipsoid in lateral view. Two acetabular setae, at least the upper one arising remote from the margin of the fixed process. Movable process long and relatively straight, its apex sometimes inclined cephalad. Aedeagus without dorsoapical hooks or lobes. Female: Basal abdominal sternite with lateral setae. Base of bursa copulatrix darkly sclerotized. Bulga of spermatheca globular. Hilla with a large papilla. Anal stylet with two ventral and one dorsal subapical setae. Large fleas, 3.5–4.5 mm. in western North America.

The following key will separate the known species of the genus with the caveat that only four of the six species are known from the diagnostic sex and some are known from so little material that we have no knowledge of the range of intraspecific variation. Even with accompanying males the females remain extremely difficult to identify, at least until more material comes to hand.

KEY TO KNOWN SPECIES OF *SPICATA*

- 1. Male 2
- Female 5
- 2. Proximal lobe of distal arm of st IX with a dense submarginal patch of curly setae 3
- Proximal lobe of distal arm of st IX with a few long setae that are not curled 4
- 3. Fixed and movable processes long and narrow, the latter with almost parallel margins (Fig. 1); apex of st VIII clavate (Fig. 2); apical lobe of st IX long and narrow, its cephalic and caudal margins subparallel (Fig. 3) *comis*
- Fixed and movable processes broader mesally, their margins not parallel (Fig. 10); apex of st VIII not clavate, its margins almost parallel (Fig. 11); apical lobe of st IX shorter, oval, its margins not parallel (Fig. 12) *pacifica*
- 4. Movable process $\sim 4\times$ as long as wide at widest point (Fig. 7); apex of st VIII lacking pronounced apical extension and bearing long setae only along the caudal margin (Fig. 8); api-

- cal lobe of st IX long and narrow, acuminate ventrally (Fig. 9) *rara*
- Movable process $\sim 6\times$ as long as wide at widest point (Fig. 4); apex of st VIII with an apical extension and bearing long setae laterally as well as along the caudal margin (Fig. 5); apical lobe of st IX almost oval, its cephalic and caudal margins parallel (Fig. 6) *nuditacnula*
- 5. Caudal margins of st VII with at least a shallow incision near the bottom of the segment (Fig. 18) *rara*
- Margin of this segment without an incision ... 6
- 6. Caudal margin of st VII essentially straight vertically for most of its length (Fig. 14) *comis*
- Caudal margin of st VII projecting into a lobe of varying shape 7
- 7. Caudal lobe rounded 8
- Caudal lobe angled although its apex may be rounded 9
- 8. Caudal lobe smoothly rounded from venter (Fig. 15) *monticola*
- Caudal lobe less smoothly rounded, triangular in the middle (Fig. 13) *botticeps*
- 9. Caudal lobe bluntly rounded, its ventral margin straight, or nearly so (Fig. 16) *nuditacnula*
- Caudal lobe more sharply rounded apically, its ventral margin slightly concave (Fig. 17) *pacifica*

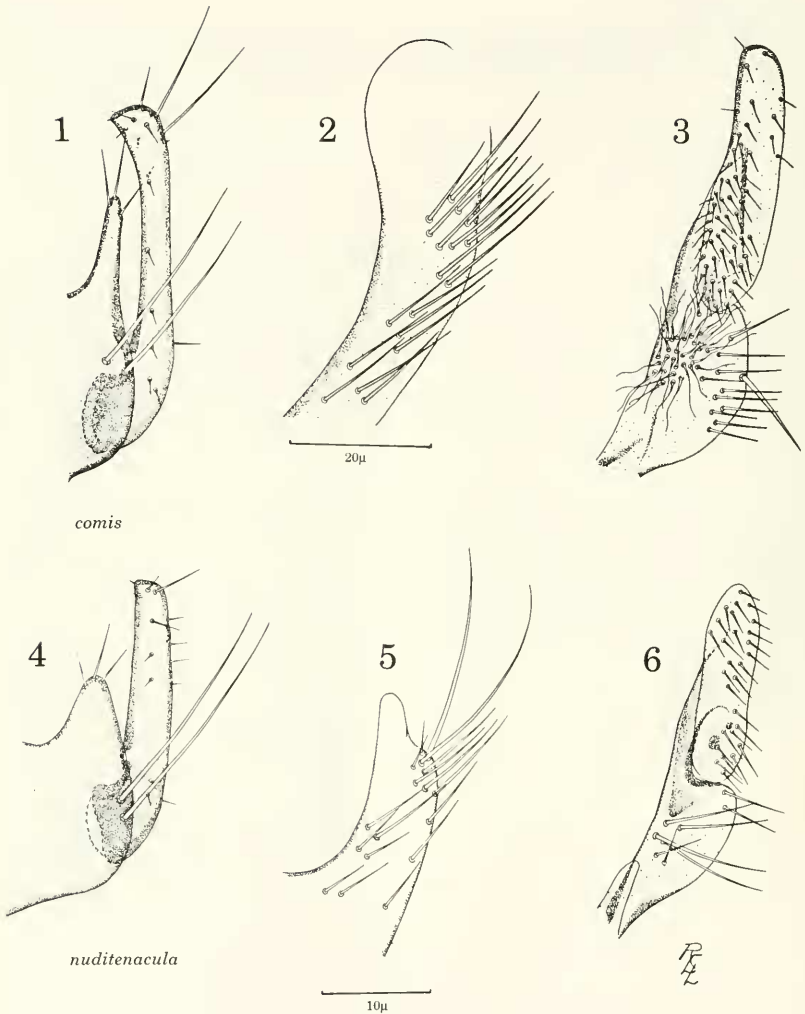
Spicata botticeps (Hubbard 1943)
(Fig. 13)

Dactylopsylla (Foxelloides) botticeps Hubbard 1943: 5, 1 unnumbered figure. USA, California, Del Norte County, school yard at Fort Dick, 41.54N 124.10W, from *Thomomys bottae*, 3.VII.1943, C. A. Hubbard leg. Holotype ♀, USNM No. 57084.

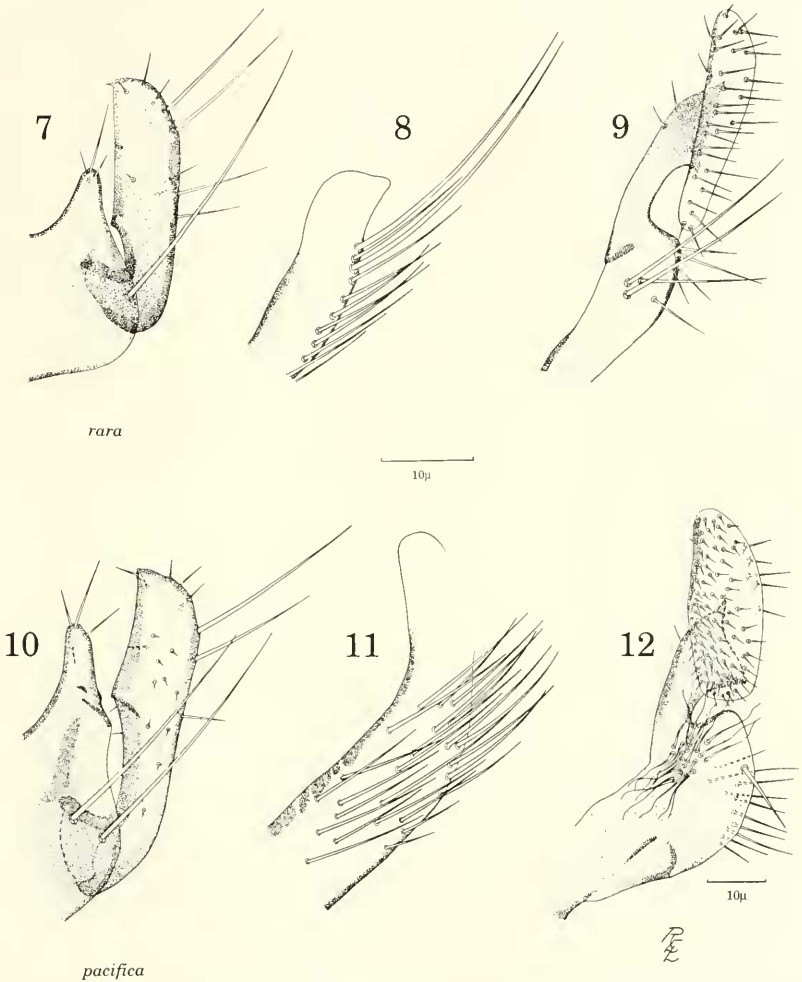
Nothing appears to have been added to our knowledge of this species since the original description. The spermatheca and contours of the caudal margin of st VII are reminiscent of *S. pacifica*, but in the absence of additional material, especially males, the species remains an enigma. Given the amount of individual variation in the species of the three genera in this subfamily, it is tempting to assign the two taxa to a single species.

Spicata comis (Jordan 1929)
(Figs. 1–3, 14)

Dactylopsylla comis Jordan 1929: 35: 38, pl. II, fig. 26. Canada, British Columbia,



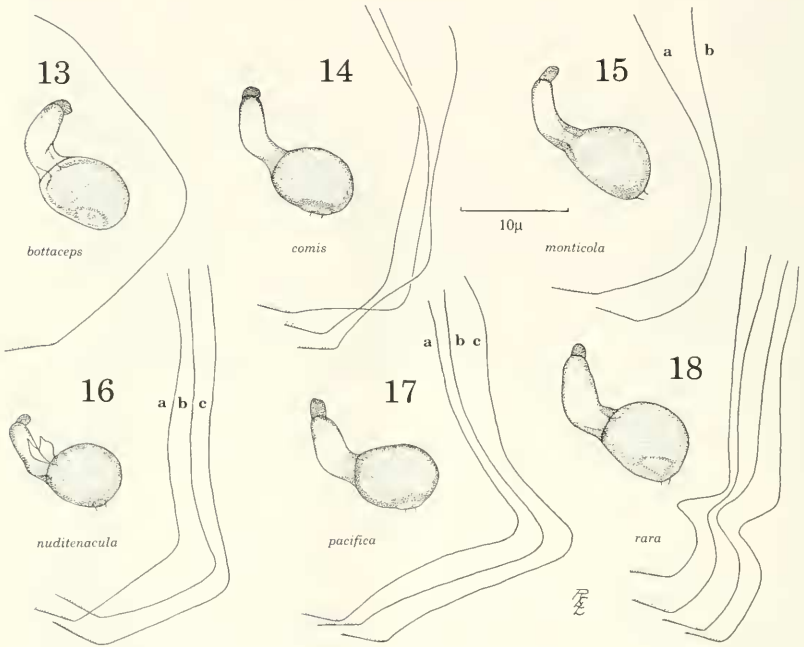
Figs. 1-6. 1-3, *Spicata comis*, not types. 1, Male clasper. 2, Apex of male st VIII. 3, Apex of male st IX. 4-6, *Spicata nuditenacula*, holotype. 4, Male clasper. 5, Apex of male st VIII. 6, Apex of male st IX.



Figs. 7-12. 7-9. *Spicata rara*, holotype. 7, Male clasper. 8, Apex of male st VIII. 9, Apex of male st IX. 10-12. *Spicata pacifica*, holotype. 10, Male clasper. 11, Apex of male st VIII. 12, Apex of male st IX.

Okanagan Landing, 50.12N 119.22W, from *Thomomys talpoides*, 2.V.1915, J. A. Munro leg. Holotype ♀, BMNH. Male described by Hubbard (1943) with the

following data: USA, Oregon, Lane County, summit of McKenzie Pass, Frog Camp, ~44.15N 121.50W, from *Thomomys mazama*, 22.VII.1938, C. A. Hub-



Figs. 13–18. Spermatheca and caudal margin of female st VII. 13, *Spicata botticeps*, holotype. 14, *S. comis*, not types. 15, *S. monticola* (a) holotype, (b) paratype. 16, *S. nuditenacula* (a) allotype, (b) *S. minidoka*, allotype, (c) *S. minidoka*, paratype. 17, *S. pacifica*, (a) allotype, (b) *S. moorei moorei*, allotype, (c) *S. m. oregona*, allotype. 18, *S. rara*, not types.

bard leg, USNM No. 57086. The author erroneously referred to this specimen as the "allotype."

Dactylopsylla comis scapoosei Hubbard 1954: 169, figure unnumbered. USA, Oregon, Columbia County, Scapoose, 45.46N 122.54W, from *Thomomys talpoides*, 8.V.1951, C. A. Hubbard leg. Holotype ♂, allotype ♀, said to be in the USNM but not listed in the computerized type inventory and not located by Adams and Lewis (1995). **New synonym.**

Dactylopsylla comis tacomae Hubbard 1954: 170, figure unnumbered. USA, Washington, Pierce County, Tacoma, 47.16N 122.30W, from *Thomomys mazama*, 10.XI.1947, C. A. Hubbard leg.

Holotype ♂, allotype ♀, USNM No. 104686. **New synonym.**

Dactylopsylla comis walkeri Hubbard 1954: 170, figure unnumbered. USA, Oregon, Curry County, Wedderburn, 42.27N 124.26W, from *Thomomys monticola*, 18.IX.1949, C. A. Hubbard leg. Holotype ♂, BMNH. **New synonym.**

Hubbard (1947) said that this species was so infrequently collected that he suspected it might be a nest flea or occur as adults only during the winter months. I have been able to examine eight pairs, and in addition to the localities cited in the synonymy, specimens came from Benton, Deschutes, Lane, Linn and Wasco counties in Oregon

and Pend Oreille County in Washington. Hubbard (1947) also cited three females from Del Norte County in extreme northwestern California. In passing it should be noted that Fort Dick, California, the type locality of *S. botticeps*, and Smith River, California, the collection site of Hubbard's females, are only slightly more than ten km apart, and both are situated on the coastal plain. Under the circumstance the identity of these specimens is subject to considerable question.

Spicata monticola (Prince 1945)
(Figs. 15)

Dactylopsylla monticola Prince 1945: 17, fig. 7. USA, Nevada, 21 km W Carson City, ~39.10N 119.55W, from *Thomomys monticola*, 19.VIII.1937, USPHS personnel leg. Holotype ♀, USNM No. 104652.

This species, described from two females, has evidently not been collected since and the male is unknown. Unlike females of so many taxa in this complex of genera, these females are unequivocally distinct. The caudal margin of st. VII is smoothly rounded and lacks a lobe or sinus. The spermatheca is elongated, its bulga and hilla are approximately equal in length and the latter bears a conspicuous apical papilla. Both the holotype and paratype are in the USNM.

The description places this species "13 miles west of Carson City, Ormsby County, Nevada." Carson City is evidently no longer associated with a county. There is no Ormsby County in Nevada or any of the contiguous states and thirteen miles west of Carson City places the locality approximately in the center of Lake Tahoe. Since the United States Public Health Service slides usually only indicate the county where the specimens were collected, the exact type locality can not be established with any degree of certainty. However, the host was the nominate subspecies of *T. monticola*. Although the range of this taxon does

extend eastward to Carson City, the bulk of its range extends northward into central California, almost to the Oregon border. In the absence of documented males, the status of the species remains obscure, but the shape of the spermatheca and the contours of st VII are distinct from other females in the genus.

Spicata nuditenacula (Prince 1945)
(Figs. 4-6, 16)

Dactylopsylla (Foxelloides) nuditenacula Prince 1945: 17, figs. 3-4. USA, Montana, Gallatin County, 14.5 km NW West Yellowstone, ~44.40N 111.07W, from *Mustela frenata*, 24.V.1938, USPHS personnel leg. Holotype ♂, allotype ♀, USNM No. 104661.

Dactylopsylla minidoka Prince and Stark 1951: 136, figs. 11-15. USA, Utah, Box Elder County, Raft River Mts, Minidoka National Forest, 12 km SE Yost, 41.59N 113.32W, 1981 m, from *Thomomys talpoides*, 11.V.1947, K. R. Kelson leg. Holotype ♂, allotype ♀, USNM No. 104649. **New synonym.**

I have examined the types of *S. nuditenacula* and *S. minidoka*, as well as a pair of paratypes of the latter, and find them to be conspecific. Unfortunately, I have only been able to examine five males and seven females from rather widely separated localities. In addition to the type localities of the two species I have material from Deschutes, Harney, Jefferson, and Malheur counties. Based on this distribution it seems that the species is confined to the Great Basin.

Spicata pacifica (Hubbard 1943)
(Figs. 10-12, 17)

Dactylopsylla (Foxelloides) pacifica Hubbard 1943: 4, figure [unnumbered]. USA, Oregon, Lincoln County, Devil's Lake, ~44.57N 124.00W, from *Thomomys monticola*, 26.VI.1943, C. A. Hubbard leg. Holotype ♂, allotype ♀, USNM No. 57085.

Dactylopsylla moorei Hubbard 1949: 47,

pl. 6. USA, Washington, Wahkiakum County, 19 km NE Cathlamet, 46.13N 123.22W, from *Thomomys talpoides*, 27.V.1949, A. W. Moore leg. Holotype ♂, Allotype ♀, USNM No. 104653. **New synonym.**

Dactylopsylla moorei oregona Hubbard 1954: 170, figs. unnumbered. USA, Oregon, Lincoln County, Devil's Lake, ~44.57N 124.00W, from *Thomomys monticola*, 8.IX.1949, C. A. Hubbard leg. Holotype ♂, allotype ♀, USNM No. 104665. **New synonym.**

I have been able to examine four males and five females of this species, including the holotype and allotype of *S. pacifica* and holotypes and allotypes of the two subspecies of *S. moorei*. While the nominate subspecies of the latter was described from the most southwestern county of Washington state, it should be noted that both *S. pacifica* and *S. moorei oregona* were described from the same locality and host species in adjacent Clatsop County, Oregon, about six years apart. All three taxa conform to the diagnostic characters of *S. pacifica* and the latter two are thus considered to be junior synonyms.

Spicata rara (1. Fox 1940)
(Figs. 7-9, 18)

Dactylopsylla (Spicata) rara 1. Fox 1940: 275, figs. 5-6. USA, Colorado, Jackson County, *sine loco*, from *Thomomys fossor* [= *talpoides*], 13.VII.1926, S. C. McCampbell leg. Holotype ♂, USNM No. 54013.

In addition to the holotype of this species I have been able to examine five males and four females from Jackson and Montezuma counties, Colorado, and Big Horn County, Wyoming, from *Thomomys talpoides* and *T. bottae*. Most were collected in early May so this may be a "winter" species in the sense that adults are most common during the cooler months.

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